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ABSTRACT

A system of measuring faculty workloads consistently and objectively has been devised and successfully applied at Pennsylvania State University's Behrend College. Its value is greatest in assessing and balancing the diverse faculty assignments within interdisciplinary and heterogeneous administrative units. It permits a legitimate comparison of the staffing of those units with that of the more conventional department. The approach, which is a point system for measuring workload, is also effectively used with administrative computers. The point system applies points to course assignments, taking into account factors such as repeated sections, large enrollments, and team teaching. One assumption is that the total instructional workload consists of three elements: time spent in preparing and grading lectures and exams, time spent in the classroom, and time spent in the laboratory or practicum. Additional assumptions are that faculty preparation/grading time spent outside of the classroom or practicum is related primarily to student credit hours; and the total measured workload is related to a consensus full-time load. Examples of calculating the instructional workload are included. One purpose of the point system is that it enhances a computerized display of the workload assignments. (SW)

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QUANTITATIVE ASSESSMENT OF FACULTY WORKLOADS

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by

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ABSTRACT

A system of measuring faculty workloads consistently and objectively has been devised and successfully applied. Its value is greatest in assessing and balancing the diverse faculty assignments within interdisciplinary and heterogeneous administrative units. It permits a legitimate comparison of the staffing of those units with that of more conventional departments. It is an effective instrument to be used with administrative computers.

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This paper was presented at the Annual Meeting of the Association for the Study of Higher Education held at the Conrad Hilton Hotel in Chicago, Illinois, March 12-14, 1984. This paper was reviewed by ASHE and was judged to be of high quality and of interest to others concerned with the research of higher education. It has therefore been selected to be included in the ERIC collection of ASHE conference papers.

An important and difficult task in most institutions is maintenance of an equitable distribution of faculty workloads. The problem is greatest in heterogeneous administrative units, such as interdisciplinary departments where great differences can be found between functional assignments.

A typical case in point is found at Penn State's Behrend College in Erie, Pennsylvania, where the entire College is organized into three major interdisciplinary divisions. In the Division of Science, Engineering and Technology faculty serve programs maintained by four large University colleges: Science, Engineering, Earth and Mineral Sciences, and Agriculture. They also provide a variety of interdisciplinary curricula unique within Penn State, engage in research, serve on committees, and participate in academic administrative functions. All-in-all, the variety of these complex assignments is enough to strain any administrator committed to equity and fair workload assignments and assessments.

Demands for accountability are increasingly stringent. A reliable system of measuring and distributing workloads is essential in presenting creditable support of operating budgets. In the case of recognized overloads it is very important that the extent of the overload be measured and recorded as evidence of needed relief or as the basis by which equity can be dealt through compensatory relief in subsequent assignments.

The "Point System" For Measuring Workload

In order to achieve these goals, a workload "point system" has been adopted in the Division and used successfully for the past five years.

It has enabled the Division to accomplish a number of objectives. It has accurately supported a case for additional faculty in order to eliminate overloads, to provide release time from teaching to permit research involvement, and to staff a number of new academic programs. In the latter case, it has been possible to predict within a few tenths of a full time equivalent faculty position, the needs within each traditional discipline. Moreover, the point system has made it easy to establish a uniform and fair wage compensation basis for the many part-time faculty drawn from local industry.

Above all, the point system is intended to represent a fair assessment of work assigned to each individual. It is not intended to accommodate each individual's own interpretation of his work load, or his preferences. Those are remote from objective measure, and must remain in the domain of discretionary administrative decisions made in the light of objective measures. Nevertheless, the faculty set the workload criteria through consensus actions. The point system must correlate with established criteria of the larger academic body. This is not always easy to determine. The administration must always ask: is a full load as measured by the point system generally recognized as a full load?

The point system is not, however, totally empirical. It is built upon a number of logical premises, most of which relate to student course loads. It was not accidental that the nominal full load came out at thirty five hours per week (leaving five hours of a forty hour week for advising and miscellaneous committee responsibilities which are not measured). The system is designed to measure actual time appropriate for meeting most of the faculty task assignments.

Research supported by external funding is usually easy to relate to a specific level of effort. Institutional support for research and faculty administration assignments are usually expressed in terms of a certain level of effort. The point system assigns appropriate values to these assignments consistent with the measure of instruction. Professional development and non-funded professional activities are not included.

Assumptions And Instructional Workload Criteria

The point system does not simply apply points to courses. Rather it applies points to course assignments, taking into account factors such as repeated sections, large enrollments and team teaching.

The first main assumption is that the total instructional workload consists of three elements: time spent in preparing and grading lectures and exams, time spent in the classroom, and time spent in the laboratory or practicum. The measure of total instructional workload is taken as the sum of these commitments over all the assigned courses.

These elements are based on course attributes in the form of credit hours, lecture or recitation periods, and practicum periods. At Penn State, the catalog provides this information for every course in an abbreviated format. For example, the notation (3:2:4) denotes a three credit course meeting for two periods of lecture or recitation and four periods of practicum each week. For the purposes of the point system, such a course has been broken down into two or more components. In all cases, the credits attributed to lecture and recitation have been taken as equal to the number of periods of

lecture and recitation. Any remaining credits are attributed to practica and designated with a suffix P. Hence, the cataloged Chemistry 35 (3:2:4) has been separated into Chem 35 (2: :0) and Chem 35 P (1:0:4).

A tabulation of time spent in the classroom or practicum is provided simply by listing the number of periods per week according to the catalog descriptions. An estimate of the time normally expected in preparation and grading is more complex, and is provided by a number of assumptions and formulae. Toward this end, the second main assumption is that faculty time spent outside of the classroom or practicum in preparation and grading is related primarily to student credit hours. For this reason it will be referred to as the "calculated credit load", or simply "credit load." Included in this assumption is that the first of several course sections an instructor teaches creates the greatest portion of his total non-contact time. For lectures and recitations, the first section met has been assigned a weekly credit load equal to three times the student credit hours. For each subsequent section the credit load is valued at the number of student credit hours.

Two alternative schemes have been used to account for large lecture and recitation classes. The first simply provides additional points for classes larger than sixty students. The second scheme provides additional points in proportion to the number of students.

Similarly, two schemes have been used for laboratory (practicum) sections. The first scheme, which is identical to that for lecture and recitations, has been suspected of underassessing the workload for

biology and chemistry. A second scheme recognizes that the laboratory workload for repeated sections is proportional to the total number of students served, and repeated sections are not discounted.

Engineering graphics courses have been handled as an exception to the rules by which other lecture, recitation and practicum course assignments have been valued. For these assignments, faculty time in preparation and grading is related to both student credit hours and student contact hours.

Some additional factors have been taken into account in modifying the non-contact time "credit load." The measure is scaled with certain enrollment increments, and discounted for "media" courses for which the preparation time is minimal.

The measure of workload can account for the work-saving approach in which a number of slightly different courses share meeting time, place and instructor. One course, for instance, might have an extra recitation period or incorporate a laboratory not required of another course. Those portions of the courses which are shared contribute only once to the calculated faculty workload.

A third main assumption relates the total measured workload to a consensus full-time load. The full-time load for an academic year has been keyed to a typical mathematics full-time teaching assignment for which the class size is no greater than 44, and for which the instructor has no assistants. Such an assignment consists of courses uniformly cataloged as (3:3:0). For many years such an assignment for an academic year consisting of three ten-week terms has been:

2 terms: 3 lecture sections requiring 2 separate preparations;

1 term: 2 lecture sections requiring 2 separate preparations.

Using the point system, for this assignment the total workload for the academic year is 84 points, an average of 28 points per term. Since each meeting period under the term system is 75 minutes long, and each point is equivalent to a meeting period, the total workload for this consensus full-time assignment is 35 hours per week for 30 weeks.

The point system applies equally well to the semester system. The total workload for the academic year is still 84 points, an average of 42 points per semester. Since each meeting period under a 15-week semester system is 50 minutes long, the full-time assignment is still 35 hours per week for 30 weeks.

Instructional Workload Calculations

Each of the measures of instructional workload is expressible as a formula. The basic measure of instructional workload is referred to simply as the LOAD, and is given by

LOAD = CALCULATED CREDIT LOAD
+ LECTURE OR RECITATION CONTACT PERIODS
+ LABORATORY (PRACTICUM) CONTACT PERIODS

where the calculated credit load (CCL)is determined according to one or more of the following rules. Sequential calculations are often used in such a way that CCL is replaced with new values.

Scheme 1:

For lectures or recitations, and for laboratories (practica):

First section:	CCL = CREDITS X 3
Each repeated section:	CCL = CREDITS
Large sections (#)	
(enrollment > 60)	CCL = CCL + CREDITS

Scheme 2: Calculated Credit Loads scaled to enrollments in smallest integer increments

For lectures or recitations:

First section:	CCL = CREDITS X 3
Each repeated section:	CCL = CREDITS
Enrollments > 45:	CCL = CCL + 1
	+ int[CREDITS(ENROL - 45)/15]

For laboratories (practica):

All sections:	CCL = CREDITS X 2
Enrollments > 20	CCL = CCL + 1
	+ int[CREDITS(ENROL - 20)/10]

Seminar (*):	CCL = 0
Course taught by media and proctor (-):	CCL = CCL - CREDITS
Course team taught or shared (%):	CCL = int[CCL X (% share)/100 + ½]
Engineering Graphics:	CCL = CREDITS + LAB PERIODS

This is the sequence in which these formulae for the calculated credit load have been applied, but other specific applications might suggest otherwise. The only other calculations to derive the instructional work load (LOAD) for a course assignment is the addition of the contact periods.

Other Workload Components

Workload assignments such as faculty administrative duties or participation in externally funded projects are assigned LOADs in two ways. Traditionally, administrative duties have justified release from teaching assignments in terms of 'sections' of release from teaching the most prevalent three credit course. In equating such an assignment to a cataloged (3:3:0) course, it can be distributed over three terms as three (1:1:0) assignments. Since it is treated as a 'first section' in the calculation schemes above, the calculated credit load is 3, and the contribution of this assignment to the total LOAD for the term is 3 + 1 + 0 = 4.

The second way in which non-instructional workloads can be set is to simply input the number of classroom periods equivalent to the time committed to the task.

Working Displays

Of course, one purpose of the point system is that it enhances a computerized display of the workload assignments. It allows a permanent, complete and accurate record to be maintained. Two display formats have been designed for complementary purposes. Table I displays the term by term, or semester by semester workload for each faculty member, with the faculty arranged and/or grouped in any convenient order. The point system provides a simple measure of each person's workload and allows the administration to measure the workload cost of maintaining every course section.

In addition to course assignments and corresponding tabulated

workloads, a number of faculty administrative and research assignments are illustrated. The assignment of section numbers to such assignments is merely a convenient way of coding each persons role.

A system of suffixes and symbols enables one to identify the various performed calculations and the special characteristics of the assignments:

/....Combined with Next Course	M....In Charge of Major
-....Media Course	C....Coordinator
$....Extra Compensation	G....Group Leader
%....Shared Course	R....Research
*....Seminar	A....Administration
E....Evening Section	D....Curriculum Development
#....Large Enrollment (scheme 1 only)	I....Special Instruction

Table II displays the scheduled courses in alphabetical/numerical order, the faculty assigned to each section and the section enrollments. Used together, the displays of Tables I and II provide a valuable device for assigning faculty to courses and scheduling meeting rooms and times.

Faculty administrative assignments and funded research responsibilities are seldom properly accounted for. Both have been accounted for in the compilation of faculty workload in Table I. The Behrend experience has illustrated the value of recording these assignments separately with two additional displays. Table III presents the faculty administrative workload, and is a convenient

device for recording the enrollments of the curricular programs. Enrollment trends can often be attributed to the efforts of the faculty member in charge of the program. Table IV displays the externally funded projects of the unit, with the workload responsibilities of the principal investigator and the participating faculty. In the present application, since the salary for part time faculty is scaled to workload points, Table IV provides a summary of the required subsidy from external funds to the general budget to cover teaching assignments.

Data Entry

One of the advantages and purposes of the point system is that it is easily managed with the aid of computers. The need for periodic updating is conveniently met through retrieval and modification of stored input data. Data input for the Fortran program presently used consists of lists separated by blank records (card images):

a master list (alpha/numerical) of all courses and other assignments with catalog course attributes (credit hours/lecture/practicum),

a master list (alphabetical) of all faculty and their disciplines,

a set of flags to call for the various output tables, to call for a check on course section assignments, and to assign the choice of credit workload scheme, and

sequential listings of workload assignments by term or semester, and by faculty.

The last list includes grouped assignments to various disciplines and designated "staff," and lists of courses offered but cancelled. It is the list which is changed most frequently (until final enrollments are determined). The master lists require changing only as previously unoffered courses or new faculty are added.

Checks are performed to identify assigned courses missing from the master course list, assigned faculty missing from the master faculty list, missing or repeated section assignments and other input data stream errors.

Comparison with Other Systems of Faculty Workload Measurement

The need for objective measures has been made by others. A survey of definitions and measurements of faculty workloads has been presented by Bleything (1983). Faculty workload formulae vary in basic structure, complexity and comprehensiveness.

Comparisons of point systems ('unit systems') with other methods illustrate that point systems can more uniformly treat disparate types of instructional workload assignment. The point system presented herein differs markedly from the others reported in the literature. It was not derived from an analysis of the distribution of faculty time among various assignments. It more nearly represents the concensus of a large University implied by the adoption of time-tested standards for student credit hours and full-time faculty assignments.

A workable point system must permit the use of high speed computers. To borrow a popular computing term, it must be 'user friendly.' Only the significant statistical factors should be included, and a realistic treatment should recognize the limited precision inherent in such analyses. This system has these characteristics. Most of the data is routinely used for other administrative essentials. Every institution maintains the required data in degree program catalogs or in the offices which produce timetables of classes and room schedules. In fact, these offices can use Tables I and II in constructing timetables and schedules as successfully tested at The Behrend College.

References

Bleything, Willard B. (1983). On the workload of faculty, Parts I through III. Journal of Optometric Education, 8, 7-22.

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ACADEMIC YEAR 1982-1983 TABLE 1: FACULTY ASSIGNMENTS AND WORKLOADS

INSTRUCTOR	SUMMER	FALL	WINTER	SPRING	LOAD TOTALS
	SEC: LOAD :ENR	SEC: LOAD :ENR	SEC: LOAD :ENR	SEC: LOAD :ENR	
ENGINEER					
LANGLEY, S.		EG 001 1 7:0:5 25	EMCH 013 1 9:3:0 23	EMCH 012 L 1 3:1:0 46	
		EMCH 011 E 1 9:3:0 24	ME 022 1 9:3:0 26	EMCH 012 R 1 6:2:0 30	
		2MET G 3:1:0 50	2MET G 3:1:0 45	EMCH 012 R 2 2:2:0 16	
				EMCH 215 1 6:2:0 9	
				2MET G 3:1:0 41	
		19+ 4+ 5=28	21+ 7+ 0=28	20+ 8+ 0=28	84
MATH					
RIEMANN, B.	MATH 004 1 6:2:0 19	MATH 004 $E 1 6:2:0 25	MATH 120 1 9:3:0 42	MATH 120 1 9:3:0 45	
		MATH 120 2 9:3:0 40	MATH 120 E 2 3:3:0 20	MATH 162 1 9:3:0 39	
		MATH 120 1 3:3:0 29	MATH 161 1 9:3:0 38		
		MATH 161 1 9:3:0 34			
	6+ 2+ 0= 8	21+ 9+ 0=30	21+ 9+ 0=30	18+ 6+ 0=24	84
PHYSICS					
EINSTEIN, A.	USDOE R 1 16	PHYS 201 # 1 4:1:0 72	PHYS 203 / 1 3:1:0 53	METEO 300 -/ 1 4:2:0 38	
		PHYS 201 R 1 6:2:0 34	PHYS 204 1 14	METEO 303 - 1 44	
		PHYS 201 R 2 2:2:0 38	PHYS 203 R/ 2 6:2:0 28	METEO 303 P 1 3:0:2 21	
		NSF D 1 11	PHYS 204 R 2 4	METEO 303 P 2 1:0:2 23	
			PHYS 204 P 1 3:0:2 10	PHYS 237 % 1 5:2:0 18	
			PHYS 204 P 2 1:0:2 3	NSF D 1 8	
			NSF D 1 8		
	16+ 0+ 0=16	23+ 5+ 0=28	21+ 3+ 4=28	21+ 4+ 4=29	85
GIBBS, W.		PHYS 201 P 1 3:0:1 20	PHYS 203 R/ 1 6:2:0 25	PHYS 201 P 1 3:0:1 18	
		PHYS 201 P 2 1:0:1 21	PHYS 204 R 1 10	PHYS 201 P 2 1:0:1 21	
		PHYS 201 P 3 1:0:1 13	PHYS 420 1 9:3:0 16	PHYS 201 P 3 1:0:1 22	
		PHYS 237 1 9:3:0 15	APLSC M 3:1:0 11	PHYS 201 P 4 1:0:1 19	
		FAC SEN A 3:1:0	FAC SEN A 3:1:0	PHYS 201 P 5 1:0:1 18	
		APLSC M 3:1:0 12		PHYS 237 % 1 5:2:0 18	
				APLSC M 3:1:0 10	
				FAC SEN A 3:1:0	
		20+ 5+ 3=28	21+ 7+ 0=28	18+ 4+ 5=27	83
PHYS STAFF				PHYS 497 * 1 0:1:0 5	
				0+ 1+ 0= 1	1
CANCELLED		PHYS 201 P 4 3:0:1 0			
		3+ 0+ 1= 4			4

ACADEMIC YEAR 1982-1983 TABLE 2: RECORD OF COURSES OFFERED

COURSE	CRD/LEC/LAB	SECT	SUMMER	FALL	WINTER	SPRING
			ENRL/INSTRUCTOR	ENRL/INSTRUCTOR	ENRL/INSTRUCTOR	ENRL/INSTRUCTOR
EG 001	2 0 5	1		25/LANGLEY, S.		
EMCH 011	3 3 0	1		E 24/LANGLEY, S.		
EMCH 012 L	1 1 0	1				46/LANGLEY, S.
R	2 2 0	1				30/LANGLEY, S.
		2				16/LANGLEY, S.
EMCH 013	3 3 0	1			23/LANGLEY, S.	
EMCH 215	2 2 0	1				9/LANGLEY, S.
MATH 004	2 2 0	1	19/RIEMANN, B.	E 25/RIEMANN, B.		
MATH 120	3 3 0	1		29/RIEMANN, B.	42/RIEMANN, B.	45/RIEMANN, B.
		2		40/RIEMANN, B.	E 20/RIEMANN, B.	
MATH 161	3 3 0	1		34/RIEMANN, B.	E 38/RIEMANN, B.	
MATH 162	3 3 0	1				39/RIEMANN, B.
ME 022	3 3 0	1			26/LANGLEY, S.	
METEO 300 -	2 2 0	1				38/EINSTEIN, A
METEO 303 -	2 2 0	1				44/EINSTEIN, A
P	1 0 2	1				21/EINSTEIN, A
		2				23/EINSTEIN, A
PHYS 201	1 1 0	1		72/EINSTEIN, A		
R	2 2 0	1		34/EINSTEIN, A		
		2		38/EINSTEIN, A		
P	1 0 1	1		20/GIBBS, W.		18/GIBBS, W.
		2		21/GIBBS, W.		21/GIBBS, W.
		3		13/GIBBS, W.		22/GIBBS, W.
		4		0/CANCELLED		19/GIBBS, W.
		5				18/GIBBS, W.
PHYS 203	1 1 0	1			E 53/EINSTEIN, A	
R	2 2 0	1			25/GIBBS, W.	
		2			28/EINSTEIN, A	

ACADEMIC YEAR 1982-1983

TABLE 3: INSTRUCTIONAL ADMINISTRATIVE ASSIGNMENTS AND STUDENT ENROLLMENTS

	SUMMER	FALL	WINTER	SPRING
	ENRL/INSTRUCTOR	ENRL/INSTRUCTOR	ENRL/INSTRUCTOR	ENRL/INSTRUCTOR
GROUP LEADER				
2MET		50/LANGLEY, S.	45/LANGLEY, S.	41/LANGLEY, S.
IN CHARGE OF MAJOR				
APLSC				
FACULTY GOVERNANCE				
FACULTY SENATE				

ACADEMIC YEAR 1982-1983

TABLE 4: EXTERNALLY FUNDED RESEARCH AND CURRICULUM DEVELOPMENT

	SUMMER	FALL	WINTER	SPRING
	LOAD/FACULTY	LOAD/FACULTY	LOAD/FACULTY	LOAD/FACULTY
RESEARCH				
USDOE	16/EINSTEIN			
CURRICULUM DEVELPMENT				
NSF		11/EINSTEIN	8/EINSTEIN	8/EINSTEIN